Small-scale fisheries in ecologically sensitive areas: opportunities and challenges for sustainability under diverse institutional arrangements

Ana Cinti[1], José M. (Lobo) Orensanz[1], Ana M. Parma[1], Jaime Aburto[2], Mauricio Castrejón[3]

[1]CENPAT-CONICET, Puerto Madryn, Chubut, Argentina.
[2] Millenium Nucleous Ecology and Sustainable Management of Oceanic Island,UCN, Coquimbo, Chile.
[3]Dalhousie University, Halifax, Nova Scotia, Canada.

- Many small-scale fisheries (SSFs) in Latin America operate within ecologically sensitive areas
- A diversity of institutional arrangements have been independently designed and implemented in several countries to accommodate SSFs and conservation

"Sr. Tourist: you are in a Protected Area. The only ones authorized to harvest shellfish are the fishers of this community"
Valdes Peninsula, Argentina

- We compared various institutional arrangements for the management of SSFs operating in ecologically sensitive areas, which differ in origin, objectives, design and implementation
- Which opportunities and challenges emerge for SSFs management inside Protected Areas?

Methods: literature review and direct involvement

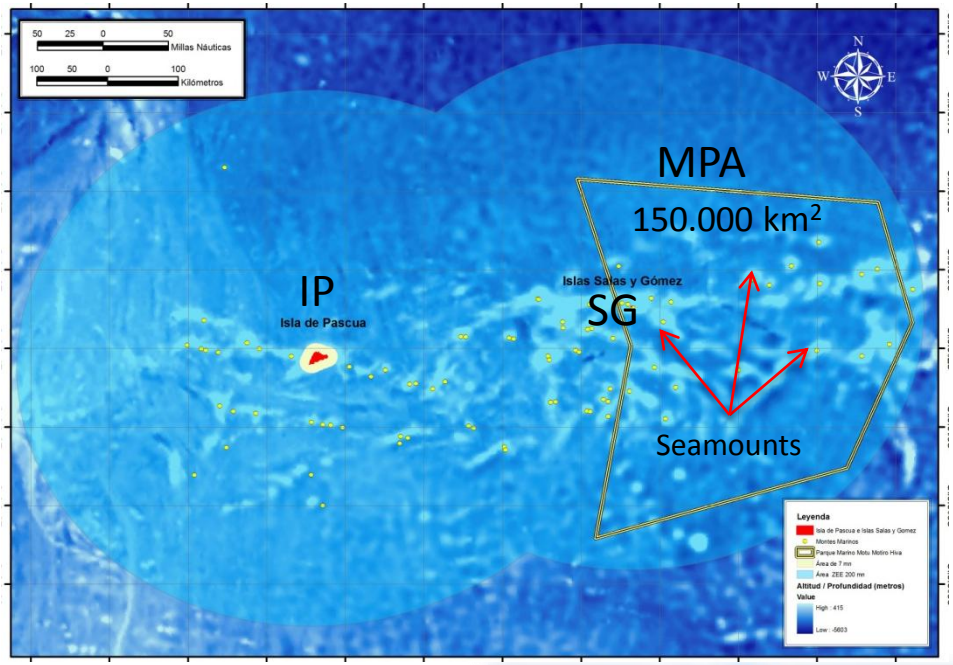
Country	Conservation unit (year created)	Fishery	Origin of cons. unit	Objectives	Design	Fishers' participation in PA management	References
Ecuador	Galápagos **Marine Reserve** (1998)	FULLY contained within PA boundaries	Top-down	Conservation & fishery enhancement	Zoning scheme. Size: 138,000 km2	yes	Heylings et al. 2002; Edgar et al. 2004; Heylings & Bravo 2007; Castrejón 2011; Hockings et al. 2012; Castrejón and Charles 2013; Castrejón et al. 2014; Castrejón and Defeo, 2015.
Argentina	Valdes Peninsula **Natural Protected Area** (2001)	FULLY contained	Top-down	Conservation & sustainable use (tourism, fisheries and cattle ranching)	Zoning scheme. Size: 6,000 km2	no	Orensanz et al., 2007; Cinti et al 2011; Fiorda et al. 2013.
Chile	Choros and Damas Islands **Marine Reserve** (2005)	NOT contained within PA boundaries	Top-down	Conservation & fishery enhancement	No-take. Size: 38.6 km2	no	Gaymer et al. 2007, Thompson et al. 2008; Cárcamo et al. 2011; Sernapesca 2011; Cárcamo & Gaymer 2013.
	Easter Island **Marine Park** (2010).	NOT contained	Top-down	Conservation	No-take. Size: 150,000 km2	no	Diario Financiero 2011; National Geographic et al. 2011; Friedlander et al. 2013; Gaymer et al. 2013; Pew 2013; Gaymer et al. 2014; Yañez et al. 2014; Zylich et al. 2014; Aburto et al. In review.
Mexico	Bahía de Loreto **National Park** (1996)	FULLY contained	Bottom-up	Sustainable resource use and conservation	Zoning scheme. Size: 2,065 km2	yes (limited)	Steinitz et al. 2005; Lopez-Sagastegui and Sala 2006; Avendaño-Ceceña 2007; Wielgus et al. 2007; Cudney-Bueno et al. 2009; Peterson 2010; CCC 2010; Rife et al. 2013.
	Bahía de los Ángeles […] **Biosphere Reserve** (2007)	FULLY contained	Bottom-up	Sustainable resource use and conservation	Zoning scheme. Size: 3,879 km2	yes (limited)	CONANP 2004; Avendaño-Ceceña 2007; Danemann and Ezcurra 2007; Saenz-Chavez and Danemann 2008; Peterson 2010; Cinti et al. 2014.
Brazil	**RESEX** Corumbau (2000)	FULLY contained	Bottom-up	Protection of culture and means of survival of traditional populations, sustainable use & conservation	Zoning scheme. Size: 900 km2	yes	Di Ciommo 2007; Moura et al. 2009; Dutra et al. 2012; Resex manager and community leadership pers. comm.
	RESEX Canavieiras (2006)	FULLY contained	Bottom-up	Same as above	Zoning scheme. Size: 1000 km2	yes	Dutra et al 2012. Resex manager and community leadership pers. comm.

Easter island Marine Park (Chile)

Top-down origin, largely driven by international agendas (big NGOs and CBD obligations), without consultation to rapanui people

No-take reserve

Objective: biodiversity conservation



Lots of conflicts between islanders and the Chilean government

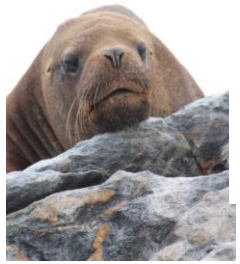
Strong local resistance led to a bottom-up process currently underway

Choros and Damas Islands Marine Reserve (Chile)

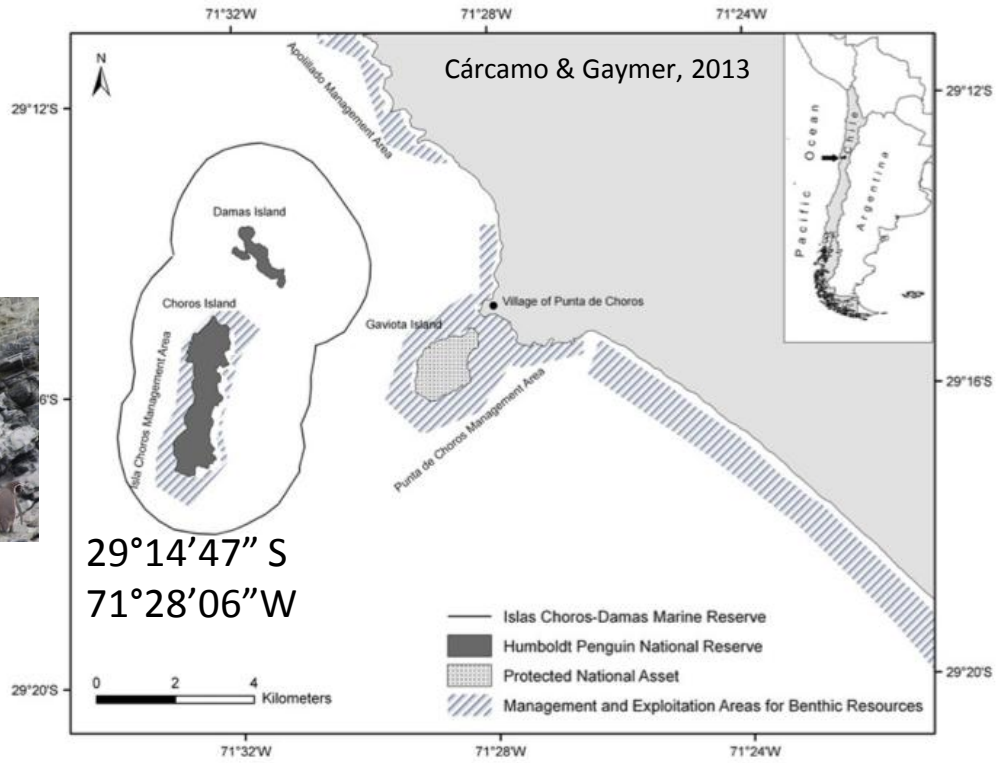
Top-down origin, created without consultation in one of the most important fishing sites of 4 fishing communities

No-take reserve

Objective: biodiversity conservation

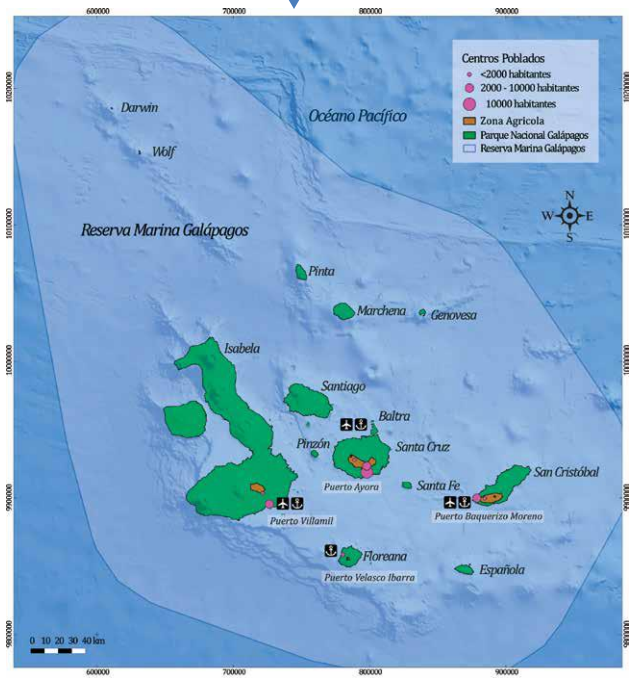


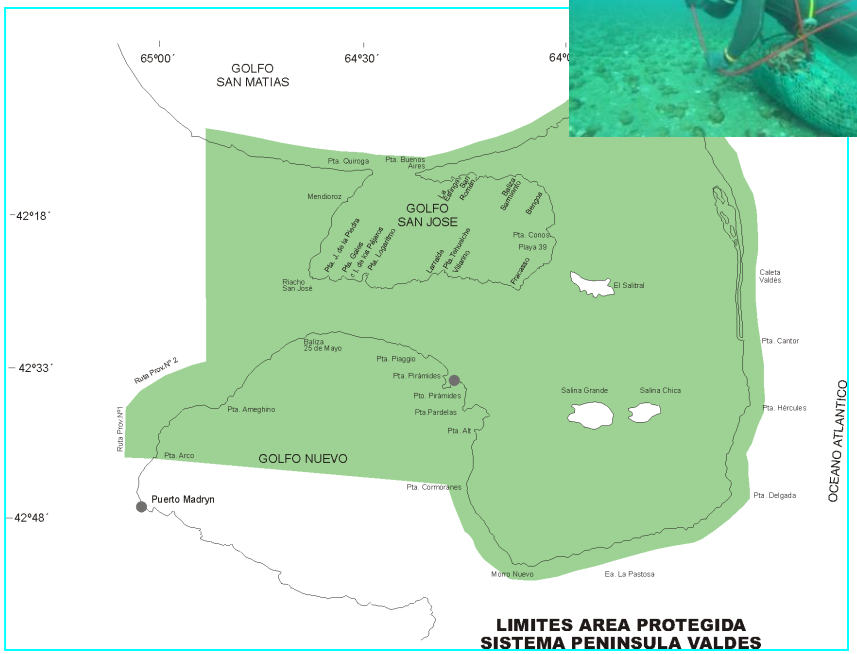
Social conflic



The fishing organization closest to the area "negotiated " the granting of a TURF inside the reserve in exchange for supporting reserve establishment

Galapagos Marine Reserve (Ecuador) & Valdes Peninsula Protected Area (Argentina)





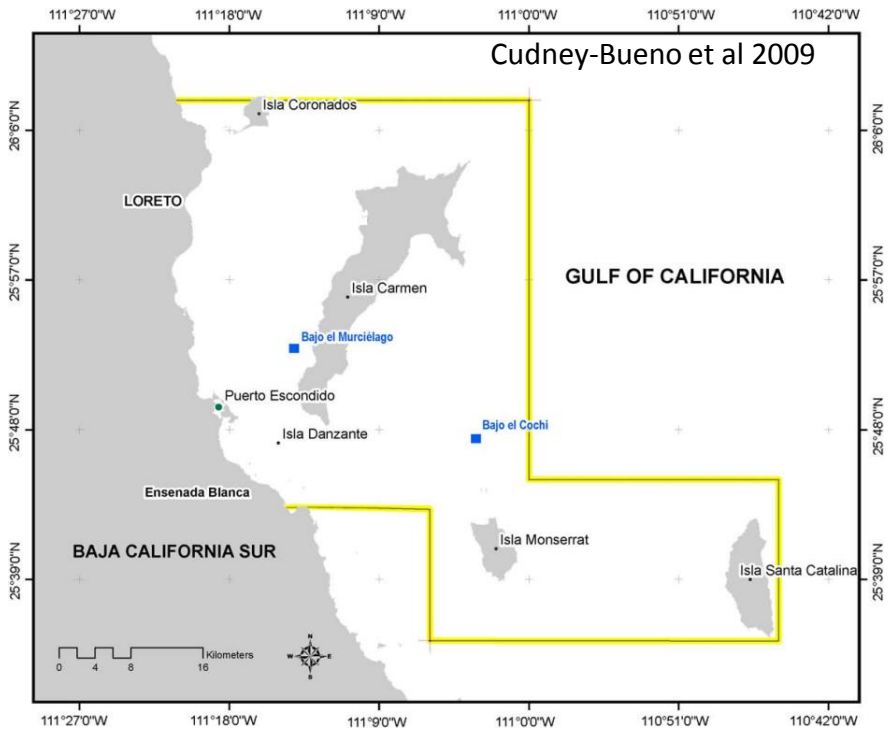
Origin: top-down origin, driven by international NGOs , international cooperation agencies and the government.
Reason: expansion of sea cucumber fishery to Galapagos.

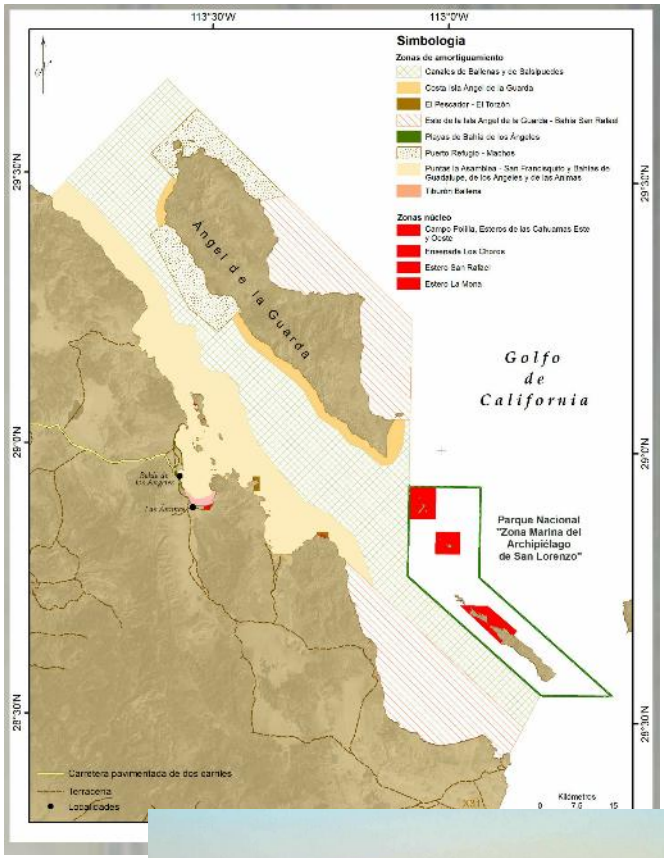
- Objectives: conservation & sustainable use
- Fishery fully contained inside the Reserve
- No-take zones: 14

Origin: top-down, created as fauna reserve to promote tourism and later re-categorized as VI (IUCN)

- Objectives: conservation & sustainable use
- Fishery fully contained inside the PA
- Without marine no-take zones

B. de Loreto Marine Park & B. de los Angeles Biosphere Reserve (Mexico)



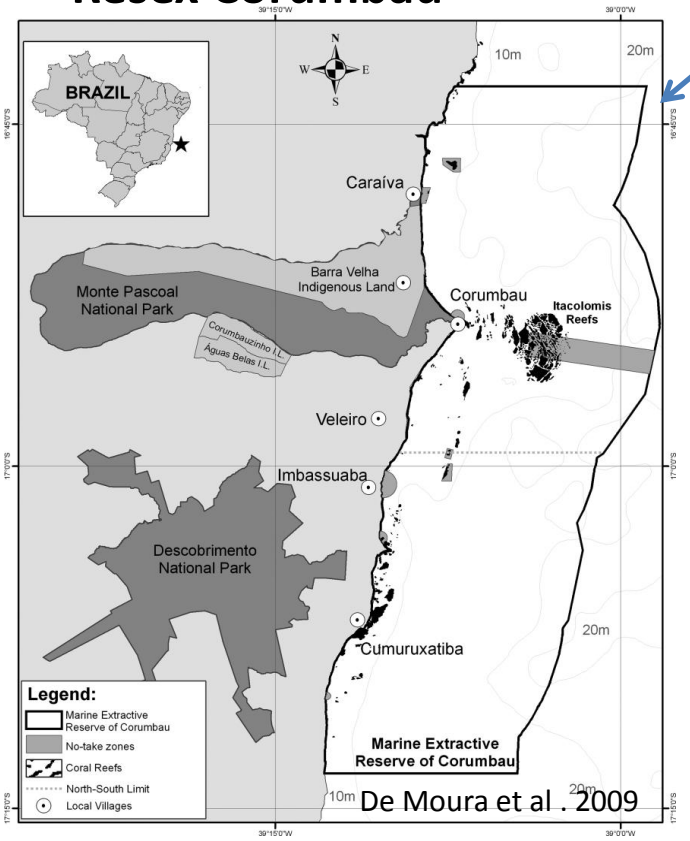


Bottom-up origin, to exclude industrial fisheries (trawlers)

- Objectives: sustainable resource use & conservation
- Several communities fish inside these areas
- Very small no-take zones but zoning with gear restrictions

Reservas Extrativistas Marinhas (RESEXs) (Brazil)

Resex Corumbau



De Moura et al . 2009

Only marine portion

Marine and terrestrial

Resex Canavieiras

Bottom-up origin, to exclude development threats and industrial fisheries (trawlers)

- Objectives: **Protection of culture and means of survival of traditional populations, sustainable use & conservation**
- Several communities
- With no-take zones

Opportunities for fisheries management inside PAs

	Chile		Ecuador	Argentina	Mexico	Brazil		
	Easter Isl. **MP**	Choros & Damas Isl. **MR**	Galápagos **MR**	Valdes Pen. **NPA**	B. Loreto **NP**	B. de los Ángeles **BR**	**RESEX** Corumbau	**RESEX** Canavieiras
Increased awareness of SSFs management issues			X	X	X	X	X	X
Exclusion of industrial fleets (trawlers)	X		X	X	X	X	X	X
Exclusion of other competing users		X		X	X	X	X	X
Prohibition of damaging fishing gears			X	X	X	X		
Exclusion of development threats (oil exploration, real state development)			X	X	X	X	X	X
Increased incentives for fishers to organize	X		X	X	X	X	X	X
Community empowerment					X	X	X	X
Increased participation in fish. management			X	X	X	X	X	X
Increased opportunities for livelihoods diversification (ecotourism)		X	X		X	X		
Devolution of management authority							X	X
Increased security of access rights			X	X			X	X
Increased socioeconomic benefits (via PA)		X	X					X
Increased knowledge sharing for management (local/scientific)			X	X	X	X	X	X
Increased alliances (NGOs/academia provide government and local nexus)	X		X	X	X	X	X	X
Emergence of community or interagency efforts to enhance enforcement						X		X

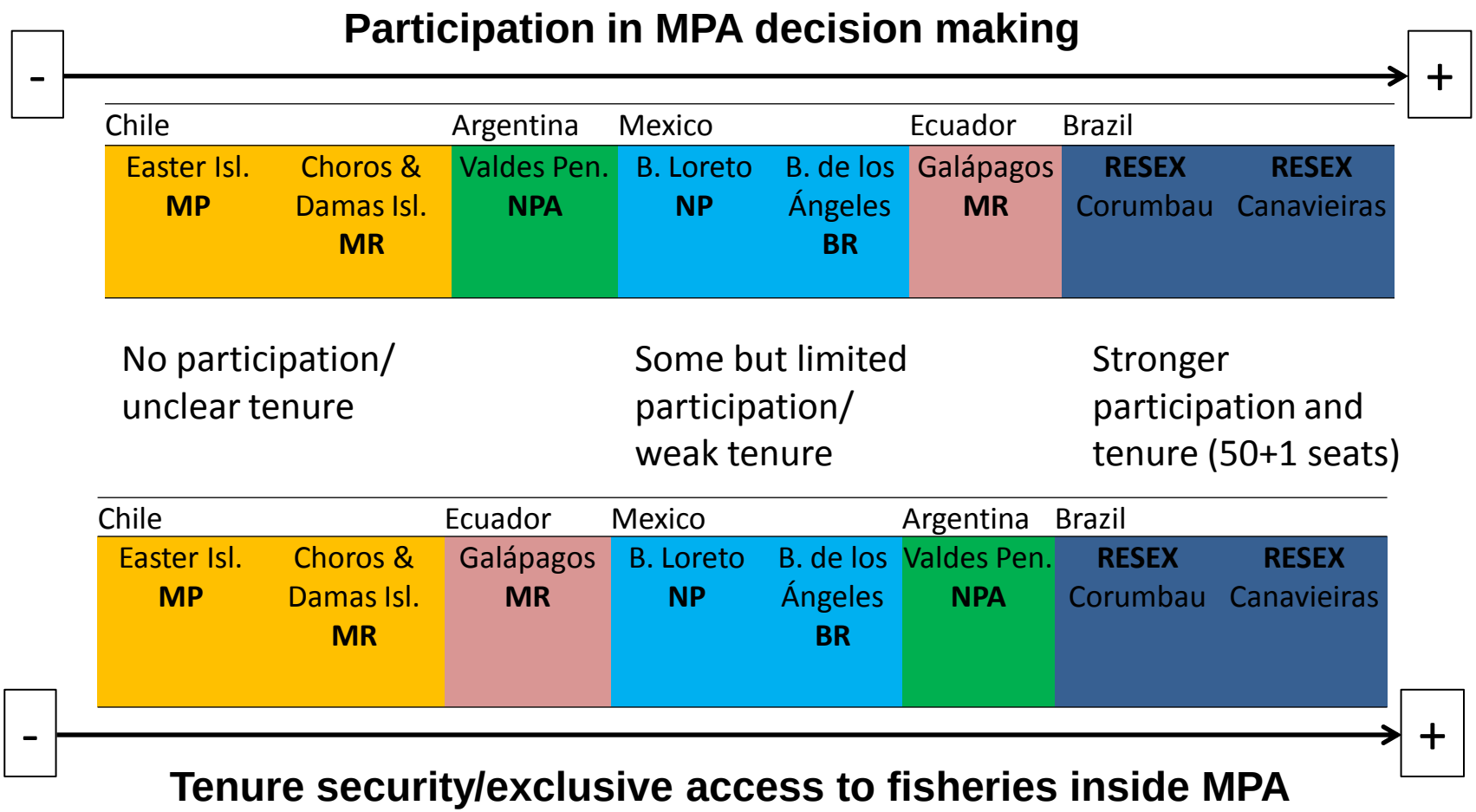
Challenges for fisheries management inside PA

	Chile		Ecuador	Argentina	Mexico		Brazil	
	Easter Isl. **MP**	Choros & Damas Isl. **MR**	Galápagos **MR**	Valdes Pen. **NPA**	B. Loreto **NP**	B. de los Ángeles **BR**	**RESEX** Corumbau	**RESEX** Canavieiras
Limited enforcement (shortage of personnel/resources, poor interagency coordination)	X	X	X	X	X	X	X	X
Competing interests/agendas favoring most powerful/influential sectors	X		X	X			X	
Eroded credibility and trust due to top-down implementation or government inaction	X	X		X	X	X	X	
Weak stewardship when contribution of no-take areas to SSFs is unproven	X	X						
Difficulty of coordination and implementation in large size MPAs	X						X	
Pressures by real state development in PAs not embracing coastal land							X	
Poverty							X	X
Limited or ineffective participation	X	X	X	X	X	X	X	
Social conflicts due to exclusion	X	X						
Weak social cohesion/leadership			X	X				
Negative externalities of tourism		X		X			X	
Declining trends of commercially important species (inadequate regulation/implementation)			X	X	X	X		
Weak definition of access rights			X		X	X		
State retention of management authority	X	X	X	X	X	X		

MPA origin and objectives- different models:

- *Top-down origin*: **international agendas with emphasis on large oceanic MPAs**. Example of Easter Island. Local involvement is still critical.
- *Top-down origin*: **conservation-driven MPAs** (e.g. fauna protection). Incentives for fishers organization increase due to perceived threats. Example of Valdes Peninsula. Agenda biased towards non fishery issues.
- *Bottom-up origin*: **fishery-driven MPAs** (e.g. to exclude industrial fisheries). Examples from Mexico, Brazil. At times difficult to balance use and conservation (inadequate regulation or weak implementation).
- *Bottom-up origin*: **defense of consuetudinary rights of traditional populations** against development threats. Conflicts due to exclusion of other sectors. Examples: Brazilian RESEX

Participation and tenure security



- Participation and tenure security not always aligned (e.g. Galapagos & Valdes Peninsula)

Final thoughts

- Involvement of local communities from the beginning is critical
- Take advantage of local initiatives/circumstances to advance conservation & sustainable use
- Weak enforcement is a key limitation
- Leadership/organization/social cohesion/empowerment need to be strengthen
- Devolution of management authority (State authority is augmented in protected areas)
- Meaningful participation in decision making (limited in general)
- Secure access rights to fisheries (generally weak)
- Implementation is key!

Preliminary analysis
Data Base to be expanded

Acknowledgments

- Alejandro Castillo, Pronatura Noroeste, Mexico
- Alexis Rife, Environmental Defense Fund, USA
- Ana Carolina Esteves Dias, Universidade Estadual de Campinas

- Centro Nacional Patagónico, CENPAT-CONICET, Argentina
- Agencia Nacional de Promoción Científica y Tecnológica, Argentina
- The Rufford Small Grants Foundation, UK